Two key parameters for assessing the properties of glass fibers

An invited talk

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The physical properties of glass fibers are more complicated than those of bulk glasses, since fibers are drawn under extreme forming conditions, e.g. larger deformation force and faster quenching. Consequently, fibers possess different microstructures, higher potential energy and entropy and a larger surface area. Owing to rather small diameters of glass fibers, accurate characterizations of the physical properties are particularly challenging, and time consuming. Therefore it would be ideal, if the glass fiber community could find and agree on two or three representative parameters to assess the fiber quality (note: not functionality). Such parameters should be easily measured and connected with other parameters. In this talk, I suggest two or three key parameters as possible criteria for assessing fiber quality and performances, with focus on both continuous fibers for reinforcement and wool fibers for insulation. One parameter is related to the fiber fictive temperature, while the other is the tensile strength. I discuss why these parameters are crucial, and I use several examples to illustrate how to determining them.

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